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The Determinants of Foreign Direct Investments in Real Estate: Turkey Case

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Abstract

The aim of this study is to investigate the key factors affecting foreign direct real estate investment (FDIRE) in Turkey's economy. A DOLS-FMOLS estimator model was developed to investigate the determinants of FDIRE in Turkey. Data was used between 2003Q1-2018Q2. This study differs from the previous ones in that this particular topic is being researched as regards the economy of Turkey for the first time. The results showed that the most important variables affecting foreign direct real estate investment in Turkey was openness and exchange rate. Furthermore, economic growth also has a positive impact. On the other hand, interest has been found to be the most negative factor affecting investments. Moreover, the increase in building construction costs directly reduce foreign real estate investment. The results show that the gradually increasing openness of Turkey's economy contributes to the increase in foreign investments in the real estate market.

Keywords: Foreign direct investment; Turkish economy; Real estate market; DOLS and FMOLS.

1. Introduction

For a country aiming to achieve growth and development, the priority is to increase investments. In order to increase investments, increase in savings should be ensured in economies. However, the desired increase in domestic savings in developing economies often fail to be sufficient (Uygur, 2012). In order to increase the savings, portfolio investments are realized in emerging economies where interest returns and profitability rates are high. Thus, the current account deficit in developing countries and economic problems as such can be financed by direct or portfolio investments (Gazel, 2018).

The opening up of Turkey's economy has accelerated thanks to the liberalization policies implemented in the early 1980s and the release of foreign capital flows in 1989 (Albayrak, 2012). Globalization has an impact on the real estate sector in Turkey and foreigners have begun to purchase real estate in Turkey since the early 2000s.

Foreign investors who have decided to invest in the real estate sector of a country are affected by several macroeconomic factors in the economy of the country in question. This study investigated factors affecting foreign direct real estate investment in the economy of Turkey. The macroeconomic variables were determined as growth rate, exchange rate, interest rates, opening up rate, building construction cost and number of tourists.

In the first part of the study, a literature review of the previously conducted empirical studies is presented. As for the econometric analysis section, data and the expected impacts of variables on foreign direct real estate investment were explained. The relationship in question was analyzed by unit root test, DOLS and FMOLS estimation methods.

2. Existing Literature

In the literature, such studies are especially focusing on China. Therefore, there is a lot of research conducted on the economy of China (Chen *et al.*, 2017; Hui and Chan, 2014; Xiuzhi and Xiaoguang, 2006). As for the studies conducted on the economy of Turkey (Lebe and Akbaş, 2014; Selim, 2009; Tem and Yilmaz, 2018), they generally research total foreign direct investment and the factors affecting housing prices or the demand for housing. This study contributes to the literature in terms of focusing on direct foreign real estate investments.

In the first study, Gerlowski *et al.* (1994) examined the location preferences of foreign companies in real estate investments in the United States. They used a random effects model that pooled time series and cross-sectional data for the 1980- 1989 period finding that high real estate prices deterred foreigners from making real estate investments. Similarly, regarding the US economy, Moshirian (2000) examined foreign direct investments in the real estate sector during the period 1985-1995. According to their findings, as US foreign financial liabilities increased and returns from the US stock market declined, there was an increase in direct foreign real estate investments.

Xiuzhi and Xiaoguang (2006), applied linear regression analysis on the economies of China, Taiwan and Japan. According to their findings, the foreign capital flowing into a country resulted in an increase in real estate prices.

Hui and Chan (2014), developed a panel regression model to examine the determinants of the real estate market in China in the period of 2005-2010. As a result of the study, it was determined that the GDP per capita and the number of foreign real estate enterprises were the most important factors affecting foreign investment in China's real estate market. Hui interpreted this result as a significant contribution made by China's economic growth and its increasing open market to the upward trend in foreign investments in the real estate market.

Chen *et al.* (2017), investigated the spatial interdependence within China's real estate industry by using the Global Vector Autoregressive (GVAR) model in the period of 2005-2015. As a result, they found contemporaneous

correlations between the highly industrialized northern region and the rest of China in terms of real estate investments and other important determinants.

Fereidouni and Al-Mulali (2014), investigated the empirical link between foreign direct investment in real estate sector and international tourism for the case study of selected OECD countries in the period of 1995-2009. They applied panel co-integration and panel Granger causality techniques to analyze both long- and short-run relationships. They identified a long-run and a bi-directional causal relationship between foreign direct investment in real estate sector and international tourism.

In another research, Fereidouni *et al.* (2014) analyzed the interrelationship between foreign direct investment in the real estate sector, economic growth, and property prices in a set of OECD countries. In this study, a dynamic panel cointegration technique was applied. They claimed that foreign direct investments in real estate did not cause property price appreciations and also did not contribute to economic growth in OECD countries in the short and the long run.

Fereidouni and Masron (2011), investigated the impact of tourism agglomeration on foreign real estate investment in 19 OECD countries between 1999 and 2008. In the analysis, they used a fixed-effects and a random-effects panel model. They determined that tourism agglomeration was a significant determinant of foreign real estate investment.

Lai and Fischer (2007), examined how foreign real estate companies determined their localization in Taiwan. They used the AHP (Analytic Hierarchy Process). It was concluded that among the economic factors, the level of operational risk seemed to be the determining decision factor for foreign real estate companies.

Rodríguez and Bustillo (2010), found that foreign real estate investment in Spain represented around 40% of total foreign direct investment inflows. Investments constituted a macroeconomic effect that maintained a long lasting housing bubble and contributed significantly to finance the rising current account deficit.

Ross (2011), analyzed the foreign direct investment for real estates in Queensland (Australia) over the period 2000-2009. He found that the USA, Canada, New Zealand, Singapore and the Peoples Republic of China all made direct real estate investment in Queensland. However, he proved that only the United Kingdom made investment consistently.

Nguyen (2011), stated that foreign direct investments stimulated the real estate market of Vietnam during the 2000-2008 period. However, he argued that the inflow of foreign direct investment into real estate and construction sectors contributed to macroeconomic instability. He stated that foreign direct investments could lead to property market bubble, capital outflow, increased debts in the banking sector and bankruptcies.

Salem and Baum (2016), identified the main determinants of foreign direct real estate investments in selected Middle Eastern and North African (MENA) countries. They used the pooled Tobit model technique for panel data for the period 2003-2009. As a result, they found that political stability was the reason why some selected MENA countries attract more real estate investments than other MENA countries.

Poon (2017), examined the key factors affecting foreign real estate investment in the UK during the period of 1987-2015 by using panel regression method. As a result, the analysis showed that GDP and house price had positive impacts on foreign real estate investment. According to Poon, wage, land price and interest rate had negative impacts. She also determined that tourists had an unexpected negative impact on foreign real estate investment.

Akinsomi *et al.* (2018), investigated the role of macro-economic indicators in explaining direct real estate returns in South Africa between 1995 and 2014 using OLS regression model. As a result, they determined that the most significant macro-economic indicators that explain total returns across all property types and provinces in South Africa were GDP, unemployment rates and interest rates.

3. Data Set

In this section, a DOLS-FMOLS estimator model was used to investigate the determinants of FDIRE in the economy of Turkey. The appropriate time period for data was set to be from 2003: Q1 to 2018: Q2. Direct foreign real estate investment was taken as the dependent variable. Descriptive variables are explained below. Data were analyzed in logarithmic form.

GDP; this variable represents the market demand/size. The GDP variable is an important factor for foreign investment. When the economy to be invested by foreigners grows, more business opportunities are created and investors' trust in this economic environment increases. Therefore, the expected impact of GDP on FDIRE is positive.

Exchange; this variable is the inflation-adjusted real effective exchange rate. According to the studies in the literature (Hui and Chan, 2014; Sirmans and Worzala, 2003), exchange rate has a significant effect on FDIRE. When the exchange rate rises, the foreign investor's money becomes more valuable in the invested country. As a result, foreign investors want to invest more. Therefore, the expected impact is positive.

Interest; interest rates represent financing costs. Investments decrease when financing costs increase. Furthermore, an increase in interest rates lead the investor to other investment instruments such as bonds etc. instead of direct investment. For these reasons, a negative impact on FDIRE is expected. Rodríguez and Bustillo (2010); He *et al.* (2009); Fereidouni and Masron (2013) used long-term interest rates in their studies. Similarly, long-term housing interest rates were used in this study, as well.

Openness; the openness ratio can be calculated in many ways. In this study, the openness rate was calculated by dividing the sum of exports and imports by GDP (X + M / GDP). Since the openness of a country denotes attracting more investment, the expected impact is positive.

Cost; the building construction cost index represents another cost item. An increase in the building construction cost increases the burden of real estate enterprises. Therefore, a negative impact on FDIRE is expected.

Tourist; this variable represents the foreign people visiting Turkey. Studies in the literature (Fereidouni and Masron, 2011;2013; Hui and Chan, 2014; Rodríguez and Bustillo, 2010) suggest that there is a positive correlation between tourism and FDIRE as tourists may buy a second property in the countries they visit resulting in foreign investment. Furthermore, tourists are informed about existing investment opportunities in the host country. For all these reasons, a positive effect on FDIRE is expected.

Table-1. Definitions and Sources of Variables

Dependent Variable	**Explanation**	**Data Source**	**Expected effect on FDIRE**
FDIRE	Realized amount of direct real estate investment from	Ministry of Treasury and Finance of Turkey (2018)	
Independent Variable			
GDP	GDP (million dollars)	OECD Statistics (2018)	+
Exchange	Real exchange rate	The Central Bank of the Republic of Turkey (TCMB) (2018)	+
İnterest	Average interest rate (long term)	The Central Bank of the Republic of Turkey (TCMB) (2018)	-
Openness	Rate Of Openness (X+M/GDP)	OECD Statistics (2018)	+
Cost	The building construction cost index	Turkish Statistical Institute (TUİK) (2018)	-
Tourist	Number of foreign tourist arrivals in a year	The Central Bank of the Republic of Turkey (TCMB) (2018)	+

4. Methodology

In the study, in order to determine the stationarity of time series, Ng-Perron unit root test which was developed recently was preferred to be used. Ng and Perron (2001) aimed to eliminate the limitations of ADF and PP tests by proposing a set of four test statistics (Yıldırım *et al.*, 2015).

These tests are the MZ_a and MZ_t tests which are the modified versions of the Phillips-Perron Z_a ve Z_t tests, MSB test which is the modified version of the Bhargava test and the MPT tests which are the modified versions of the ADF-GLS test. For the Ng and Perron (2001) test; the basic hypothesis for the MZ_a and MZ_t tests is set as unit root while it is set as stationarity for the MSB and MPT tests.

The MZ_a test statistic is shown as follows:

$$MZa = Za + (T/2)(\hat{\phi}_1 - 1)^2 \quad (1)$$

Another test statistic used in the Ng-Perron unit root test, MSB is as follows in equation number 2.

$$MSB = \left(T^{-2} \sum_{t=1}^{T} Y_{t-1}^2 / s^2 \right)^{1/2} \quad (2)$$

Another test statistic used in the Ng-Perron unit root test is the MZ_t test statistic. MSB and MZ_a test statistics are used in the calculation of this test statistic which is a modified version of the Phillips-Perron Z_t statistics.

$$MZ_t = MSB \times MZ_a \quad (3)$$

The last test statistic used in the Ng-Perron unit root test is the MPT test statistic, which is applied in two ways depending on whether there is only intercept, or intercept with trend in the series. First of all, if there is only intercept in the series,

$$MPT = \left(\bar{c} T^{-2} \sum_{t=1}^{T} \tilde{Y}_{t-1}^2 - \bar{c} T^{-1} \tilde{Y}_t^2 \right) / s_{AR}^2 \quad (4)$$

If there is both intercept and trend in the series, it is calculated as follows;

$$MPT = \left(\bar{c} T^{-2} \sum_{t=1}^{T} \tilde{Y}_{t-1}^2 + (1-\bar{c}) T^{-1} \tilde{Y}_t^2 \right) / s_{AR}^2 \quad (5)$$

In the formulas, T represents the total number of observations while $\hat{\phi}_1$ represents the coefficient of the autoregressive variable in the model used in the unit root test (Göktaş, 2008).

Park (1992), proposed a test where the null hypothesis of cointegration is tested in contrast to the alternative hypothesis of no cointegration. The Chi-square test statistics reveal that the null of cointegration cannot be rejected for all the models except for the FMOLS Model with a low significance level of 10%. A parameter instability test for *I* (1) processes proposed by Hansen (1992) is used to check the stability of parameters (Mishra and Mohanty, 2017)

Although it is simple to implement the Ordinary Least Squares (OLS) method for model estimation, it can cause some problems. For example, in the OLS method, the dynamic effect of the variables that make up the model is not taken into account. Furthermore, the OLS method may yield deviant results in estimating a model with small sampling. These deviations can result in incorrect calculation of R2. These problems related with the OLS method have led to the development of new methods (Akbaş and Şentürk, 2013).

DOLS which was developed by Stock and Watson (1993) is one of these methods. This method eliminates the problem of ignoring small samples and dynamic structures experienced with the OLS method. This method is the only robust equation approach and eliminates the problem of endogeneity by taking the delayed value and the following value of the explanatory variables. Furthermore, in this method, the autocorrelation problem is eliminated by the GLS (Generalized Least Squares) method. Model estimation with DOLS can be expressed as the equation (6) below.

$$Y_t = \beta_0 + \bar{\beta} X + \sum_{j=-q}^{p} \bar{d}_j \Delta X_{t-j} + \mu_t \quad (6)$$

In equation (6), Y_t represents dependent variable, X represents the matrix of the explanatory variables, β represents co-integrated vector, p represents the lag length while q represents the lead value.

Another co-integration estimation method used in the study is FMOLS. The FMOLS method was developed by Phillips and Hansen (1990) to obtain optimal estimates of cointegrating regressions. The FMOLS and DOLS methods estimate the long-run relationship in the cointegrating variables, and both methods can be used where explanatory variables are I (1) or I (0). The model estimation by FMOLS method is formulated by the following equation (7):

$$y_t = Ax_t + \mu_{0t} \quad (7)$$

where A is the matrix of *nxm* dimension and *xt* represents the cointegrating vector in $m=(m_1,m_2)$ dimension (Lebe and Akbaş, 2015).

5. Analysis Findings

Table 2 shows the results of the Ng-Perron unit root tests. These results are significant for the reliability of the cointegration tests since all the series are I (1) in the cointegration tests indicating that there is not a problem regarding the variables' degree of integration.

Table-2. Ng- Perron Unit Root Test Results

	Variable	MZ_a	MZ_t	MSB	MPT
Level I(0)	**Fdire**	-2.2771 (1)	-0.8009 (1)	0.3517 (1)	9.0686 (1)
	Critical Value	-5.70000	-1.62000	0.27500	4.45000
	Gdp	-1.13842 (2)	-0.35265 (2)	0.30977 (2)	10.0843 (2)
	Critical Value	-5.70000	-1.62000	0.27500	4.45000
	Interest	0.3668 (9)	0.6205 (9)	1.6916 (9)	161.564 (9)
	Critical Value	-5.70000	-1.62000	0.27500	4.45000
	Exc	-4.99972 (3)	-1.43155(3)	0.28633 (3)	5.25833 (3)
	Critical Value	-5.70000	-1.62000	0.27500	4.45000
	Openness	-1.64588(10)	-0.68873(10)	0.41846(10)	37.9564(10)
	Critical Value	-14.2000	-2.62000	0.18500	6.67000
	Tourist	-0.28441(10)	-0.35673(10)	1.25430(10)	288.226(10)
	Critical Value	-14.2000	-2.62000	0.18500	6.67000
	Cost	1.60308	1.22252	0.76260	48.2255
	Critical Value	-5.70000	-1.62000	0.27500	4.45000
First Differences I(1)	**Variable**	**MZ_a**	**MZ_t**	**MSB**	**MPT**
	Fdire	-418.99*(2)	-14.470*(2)	0.034* (2)	0.061* (2)
	Critical Value	-13.8000	-2.58000	0.17400	1.78000
	Gdp	-45.205* (4)	-4.6832* (4)	0.1036* (4)	0.7301* (4)
	Critical Value	-13.8000	-2.58000	0.17400	1.78000
	Interest	-16.623*(6)	-2.870* (6)	0.172* (6)	1.519* (6)
	Critical Value	-13.8000	-2.58000	0.17400	1.78000
	Exc	-9.803** (4)	-2.099** (4)	0.214** (4)	2.940** (4)
	Critical Value	-8.10000	-1.98000	0.23300	3.17000
	Openness	-7.068***(1)	-1.765***(1)	0.249***(1)	3.870***(1)
	Critical Value	-5.70000	-1.62000	0.27500	4.45000
	Tourist	-18.1266* (1)	-3.00812* (1)	0.16595* (1)	1.36047* (1)

	Critical Value	-13.8000	-2.58000	0.17400	1.78000
	Cost	-29.4319* (1)	-3.83603* (1)	0.13034* (1)	0.83275* (1)
	Critical Value	-13.8000	-2.58000	0.17400	1.78000

*,**. *** shows the absence of unit root at 1%, 5% and 10% significance level, respectively. Critical values of unit root tests were taken from Table 1 in Ng and Perron (2001). Values in parentheses indicate lag length.

In the Ng and Perron (2001) test; the basic hypothesis for the MZa, MZt tests is set as the presence of the unit root while it is stationarity for the MSB and MPT tests. According to the results, all variables are not stationary in terms of level values, for the calculated statistical values for MZa and MZt tests are smaller than the critical values calculated by Ng and Perron (2001). The hypothesis regarding the presence of unit root cannot be rejected. Similarly, the statistical values calculated for MSB and MPT tests are greater than the critical values calculated by Ng and Perron (2001). In other words, the hypothesis regarding the absence of unit root, which is the basic hypothesis, is rejected. According to the Ng-Perron test, when the first differences of all variables are taken, it is stationary since the results are reversed.

Table-3. Park Added Variables Cointegration Test Results

Null hypothesis: Series are cointegrated.				
Dependent Variable	**Model**	**Chi-square**	**Lag Length (df)**	**P-Value**
Fdire	DOLS	4.8889	3	0.1801
	FMOLS	1.6158	3	0.6558

The results of the Park Added Variables cointegration test are presented in Table 3. According to the test results, a cointegration relationship was determined in both DOLS and FMOLS models. The reason for this was the acceptance of the null hypothesis which argued that there was a cointegration relationship in the series. Accordingly, there is a long-run relationship between FDIRE and other macroeconomic variables.

With the determination of a long-run relationship between variables, it is possible to estimate the coefficient by means of cointegration vector estimators. In this context, estimations were made with DOLS and FMOLS models and the results are summarized in Table 4.

Table-4. DOLS and FMOLS Results

Variable	**Dynamic OLS (DOLS)**		**Full Modified OLS (FMOLS)**	
	Coefficent	**Prob.**	**Coefficent**	**Prob.**
LNGDP	0.002696***	0.0584	0.004046*	0.0022
LNINTEREST	-19.88559**	0.0289	-8.701366**	0.0316
LNEXC	10.62915*	0.0048	9.935718*	0.0000
LNOPENNESS	31.89086*	0.0018	10.10934***	0.0757
LNTOURIST	-3.39E-05	0.6418	-5.11E-05*	0.0000
LNCOST	-4.926308	0.1118	-14.50004*	0.0000
Observations	50		50	
R-squared	0,991		0.921	
Adjusted R-squared	0,978		0.908	

*, ** and *** denote significance at 1%, 5% and 10%. The results of DOLS and FMOLS based on 4 lags.

Table 4 presents the results of DOLS and FMOLS. Both estimates show 99% and 92.0% highly adjusted R-squared values for DOLS and FMOLS, respectively. The coefficients of economic growth, exchange rate and openness are found to be statistically significant at all levels and the signs are positive as expected. Furthermore, the coefficients of interest and building construction cost items variables are negative as expected. However, no positive sign was found in the tourist variable as expected. Contrary to expectations, the results showed that tourists had a negative relationship with FDIRE.

6. Conclusion, Limitations and Suggestions for Future Research

In this study, we investigated the factors affecting foreign direct real estate investments in Turkey's economy. Firstly, unit root test was applied. According to the Ng-Perron unit root test, the first differences of all variables were found to be stationary (1). The unit root test yielded results demonstrating the reliability of the cointegration tests. Subsequently, Park Added Variables cointegration test was performed. According to this; a long-run relationship between FDIRE and other macroeconomic variables has been proven.

Both DOLSAR both FMOLS forecast results showed that openness is the most important variable affecting foreign direct real estate investment in Turkey. According to the results, the 1% increase witnessed in the openness of Turkey’s economy led to an increase in foreign direct real estate investment by 10% to 31%. This result supports the theory that the openness of a country’s economy will attract more investment. The increase in the openness of Turkey’s economy after 2002 and the liberalization in foreign purchases of housing have contributed to the increase in foreign investments in the real estate market.

The second important variable that affects FDIRE positively is exchange rates. An increase of 1% in foreign exchange rates increases the foreign direct real estate investment in the range of 9.9% to 10.6%. The theory proposed

in the study was that an increase in exchange rate would increase the value of foreign investors' money which would encourage them to invest more. As a result of the analysis, it was determined that the theory in question was valid regarding Turkey's economy. According to the results, the growth of Turkey's economy has an impact on foreign direct real estate investment at small rates as 0.002% to 0.004%.

The impact of interest and building construction cost variables on FDIRE is negative as expected. Interest is the most negative factor affecting foreign direct real estate investment in Turkey's economy. An increase of 1% in interest rates reduces the investment by 8.7% and 19.8%. The reason why interest decreases investments is two-fold. Firstly, when the interest rate rises, foreign investors prefer investment instruments such as bonds, bills etc. instead of direct investment. Secondly, the increase in interest rates means that the financing cost of the investment also increases. Investments will decrease when financing costs increase. The increase in building construction costs also reduces foreign direct real estate investment by 14.5%.

The results obtained regarding the tourist variable are not positive as expected. The reason for this may be explained with the fact that foreigners make real estate investment in Turkey for financial purposes rather than tourism. All the results obtained in the FMOLS analysis are statistically significant. The results are consistent with previous studies (Fereidouni and Masron, 2013; He *et al.*, 2009; Hui and Chan, 2014; Rodríguez and Bustillo, 2010; Sirmans and Worzala, 2003) except for the tourist variable.

This study has some limitations. The housing price index and the number of foreign real estate enterprises could not be included in the analysis, since data regarding these variables could not be obtained. A price index for housing prices in Turkey has been compiled since 2010 and there is no data regarding previous years. As for the variable regarding the number of foreign real estate enterprises, there is no quarterly data. It is proposed that future research expand this study on Turkey's economy including variables such as housing price index and gross wages-salaries index.

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